A Division with a Mission

2001 was a particularly good year for LANSCE. We achieved the best overall accelerator operations availability in our 29 years of operation. LANSCE had over 500 users running more than 180 experiments, and we enjoyed a resurgence in the number of neutron scattering experimenters at the Lujan Neutron Scattering (Lujan) Center. In every part of the Division, from science at the Weapons Neutron Research Facility (WNR) and the Lujan Center to proton radiography and accelerator technology, the accomplishments were outstanding. Work done at LANSCE resulted in approximately 250 articles in conferences and peer-reviewed journals reported this past year.

The operations performance was singularly impressive. We completed our annual maintenance outage ahead of schedule, accomplishing roughly 1,400 tasks to improve operations and ready the facility. This allowed beam delivery 20 days early, and we used that time to great advantage for proton radiography (pRad) and to prepare for the user program.

On July 1, 2001, as we had promised, we began our national user program with a great deal of optimism. When we turned the beam off just after midnight on December 24, we knew the year had been enormously successful. The facility had operated for 2,500 hours with 92% overall availability and had delivered beam to the pRad facility with 100% availability for all dynamic events – a truly impressive feat. It was in large measure the dedication and professionalism of the operations staff that made this possible.

Lujan Center served over 270 users and performed more than 113 user experiments with over 95% instrument availability. For National Defense, we completed 19 experiments, including 3 in collaboration with Sandia National Laboratories. Concluding a three-year effort for the Short Pulse Spallation Source project, we commissioned three world-class diffractometers, SMARTS, HIPPO, and PCS, along with two other instruments, Asterix and a rebuilt PHAROS. A new nuclear science instrument, DANCE, was also brought into operation.

We began the year with a goal of operating at 100 μA at the Lujan Center with availability greater than 75%. Insufficient prior-year funding meant that we had no spare production target. As fate would have it, target problems occurred that required substantial analysis and approval by the DOE Office of Los Alamos Site Operations in order to continue operation at 55 μA. Fortunately, the loss in experiment count rate from the lower current at Lujan Center was very nearly compensated by our higher availability. The result was that we accommodated all scheduled experiments. For the 2002 run cycle, we will have a new target moderator reflector system completed and installed and will therefore be able to increase our beam current to 100 μA once again.

WNR served over 300 users and performed over 35 user experiments. The previously completed $^{239}Pu(n,2n)^{238}Pu$ cross-section measurements and their significance to national defense were recognized by the National Nuclear Security Administration (NNSA) through presentation of an Award of Excellence to the GEANIE team. In collaboration with scientists from Bruyères-le-Châtel in France, we began a new study of the fission process through measurements of neutron-induced fission fragment yields and emitted neutrons on GEANIE and FIGARO. Unique Neutron Resonance Spectroscopy experiments at WNR continued to provide temperatures of dynamic systems on very short timescales. We continued our collaboration with scientists from the Spallation Neutron Source (SNS) project to understand the hydrodynamic effects of shocks produced by high-intensity proton pulses on liquid metal targets. Finally, the similarity of the neutron spectrum at WNR to that produced by cosmic rays in the upper atmosphere has attracted over 40 experimenters from all segments of the semiconductor industry as they try to understand the effect of neutron-induced single event upset on integrated circuits.

Proton radiography experiments are now becoming a mainstay of the Stockpile Stewardship Program. We supported pRad with 100% beam availability for 36 dynamic events. Experiments conducted by Los Alamos, Sandia National Laboratories, and Lawrence Livermore National Laboratory (LLNL) staff using pRad at LANSCE explored a wide range of weapons-physics issues, including a collaboration with researchers in the United Kingdom to study implosion dynamics; LLNL experiments to study both spallation of material from a surface and formation of material jets; and high-explosive dynamics and experiments used to design and optimize imaging diagnostics for subcritical experiments at the Nevada Test Site. Progress towards completion of a kicker magnet system that will increase pRad beam time by a factor of five is on schedule and budget. The kicker will be installed during the 2003 maintenance outage.

We continue to be a center of excellence for the nation in high-power accelerator technology. Our major project, the Advanced Hydrotest Facility, made substantial progress on design and in the engineering development necessary to successfully build a machine of its size and complexity. Support for the SNS through intense beam studies using our proton storage ring, as well as design and engineering of the SNS accelerator, rf system, and control systems, continued to be of high quality as evidenced by positive reviews of our work. Measurements of the performance of a new superconducting rf acceleration cavity for proton linear accelerators for the Advanced Accelerator Applications project showed that they offer an attractive alternative to the more than 50-year-old drift tube accelerator structure now in common use.

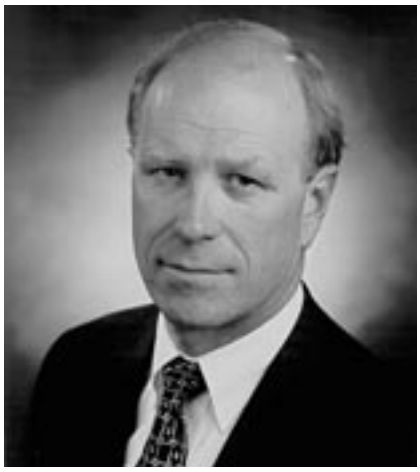
A new $6.5 million Isotope Production Facility that uses the 100-MeV proton beam will be operational in 2003. Our support for this project met all of this year's performance milestones, and we look forward to operating the new facility in 2003.

Not only was it a good and productive year, all our work was performed safely and securely. There were no security issues and no major safety incidents. I am happy to report that metrics comparing our lost workdays and recordable incidents declined from the previous year.

As a backdrop to these activities, we actively worked with several offices of the DOE and NNSA in Washington, D.C., to put in place a Memorandum of Agreement (MOA) and governance plan to address issues raised by past review committees. Three meetings of an Executive Council required by that MOA have been held and by all accounts the plan is a model for multiple office cooperation and communication within DOE for user facilities such as LANSCE that have multiple stakeholders.

I cannot conclude my first year's remarks as LANSCE Division Leader without acknowledging the contribution of my predecessors, Roger Pynn, Geoff Greene, and Earl Hoffman. A ship like LANSCE has a great deal of inertia, and it takes an enormous effort to get it on course. Once there, the steering corrections are easy. I know that I speak for LANSCE when I offer my thanks and praise to Roger, Geoff, and Earl for getting us on course. We'll do our best to keep it there!

Paul W. Lisowski



↑ *Paul W. Lisowski, LANSCE Division Director.*